

CLAIMS

1 1. Thin film apparatus comprising:

2 a) a signal layer including at least one signal conductor deposited on a first
3 surface of a dielectric substrate, wherein the signal conductor is defined by a plurality of
4 symmetrical pathways that extend in adjoining relation to one another, wherein said
5 plurality of pathways are positioned to electrically interact with each other, wherein one
6 of the pathways is unbounded on one side by the others of said plurality of pathways and
7 wherein said unbounded pathway exhibits a conductor width that is less than the
8 conductor width of the others of said plurality of pathways;

9 b) a ground plane layer deposited on a second surface of said dielectric substrate;

10 and

11 c) termination means for coupling electrical signals to said signal conductor and
12 said ground plane conductor.

1 2. Apparatus as set forth in claim 1 wherein the spacing of said unbounded
2 pathway to an adjoining one of said plurality of pathways is less than the spacings
3 between the others of said plurality of pathways.

1 3. Apparatus as set forth in claim 1 wherein said signal conductor and said
2 ground layer are sputtered onto a ceramic substrate.

1 4. Apparatus as set forth in claim 1 wherein said signal conductor comprises a
2 plurality of serpentine windings that define a delay line.

1 5. Apparatus as set forth in claim 1 wherein a plurality of apertures extend
2 through said substrate and are displaced about said signal layer and aligned to couple said
3 signal conductor to said ground plane conductor.

1 6. Apparatus as set forth in claim 1 wherein said signal conductor defines a delay

2 line.

1 7. Apparatus as set forth in claim 1 wherein said substrate comprises a flexible
2 material and said signal conductor is partitioned such that said substrate can be folded
3 during packaging.

1 8. Thin film apparatus comprising:

2 a) a signal layer including at least one signal conductor deposited on a first
3 surface of a dielectric substrate, wherein the signal conductor is defined by a coiled
4 pathway having a plurality of windings that extend in parallel relation to one another,
5 wherein one of said plurality of windings is unbounded on one side by the others of said
6 plurality of windings, wherein said unbounded winding exhibits a conductor width that is
7 less than the conductor width of the others of said plurality of windings and wherein the
8 spacing of said unbounded winding to an adjoining one of said plurality of windings is
9 less than the spacing between the others of said plurality of windings;

10 b) a ground plane layer deposited on a second surface of said dielectric substrate
11 to substantially cover the second surface; and

12 c) termination means for coupling electrical signals to said signal conductor and
13 said ground plane conductor.

1 9. Apparatus as set forth in claim 8 wherein said substrate comprises a flexible
2 material and said signal conductor is partitioned into a plurality of coiled sections that are
3 arranged such that said substrate can be folded during packaging to stack said coiled
4 sections.

1 10. Apparatus as set forth in claim 9 including a plurality of apertures that extend
2 through said substrate and are aligned to couple said signal conductor and said ground
3 plane conductor together.

1 11. Apparatus as set forth in claim 8 wherein a plurality of said windings are
2 unbounded on two sides by the others of said plurality of windings, and wherein each
3 unbounded winding exhibits a conductor width that is less than the conductor width of
4 the others of said plurality of windings and wherein the spacing of said unbounded
5 windings to the adjoining winding is less than the spacing between the others of said
6 plurality of windings.

1 12. Delay line apparatus comprising:
2 a) a signal layer including at least one signal conductor deposited on a first
3 surface of a dielectric substrate, wherein the signal conductor is defined by a plurality of
4 pathways of identical shape that extend in parallel relation to one another, wherein said
5 plurality of pathways are positioned to electrically interact with each other, wherein one
6 of the pathways is unbounded on one side by the others of said plurality of pathways,
7 wherein said unbounded pathway exhibits a conductor width that is less than the
8 conductor width of the others of said plurality of pathways and wherein the spacing of
9 said unbounded pathway to an adjoining one of said plurality of pathways is less than the
10 spacing between the others of said plurality of pathways;

11 b) a ground plane layer deposited on a second surface of said dielectric substrate
12 to substantially cover the second surface; and
13 c) termination means for coupling electrical signals to said signal conductor and
14 said ground plane conductor.

1 13. Apparatus as set forth in claim 12 wherein said substrate comprises a flexible
2 material and said signal conductor is partitioned into a plurality of coiled sections that are
3 arranged such that said substrate can be folded during packaging to stack said coiled
4 sections.

1 14. Delay line apparatus comprising:
2 a) a signal layer including at least one signal conductor deposited on a first
3 surface of a dielectric substrate, wherein the signal conductor is defined by a plurality of
4 pathways of identical shape that extend in parallel relation to one another, wherein said
5 plurality of pathways are positioned to electrically interact with each other, wherein one
6 of the pathways is unbounded on one side by the others of said plurality of pathways, and
7 wherein the spacing of said unbounded pathway to an adjoining one of said plurality of
8 pathways is less than the spacing between the others of said plurality of pathways;
9 b) a ground plane layer deposited on a second surface of said dielectric substrate
10 to substantially cover the second surface; and
11 c) termination means for coupling electrical signals to said signal conductor and
12 said ground plane conductor.